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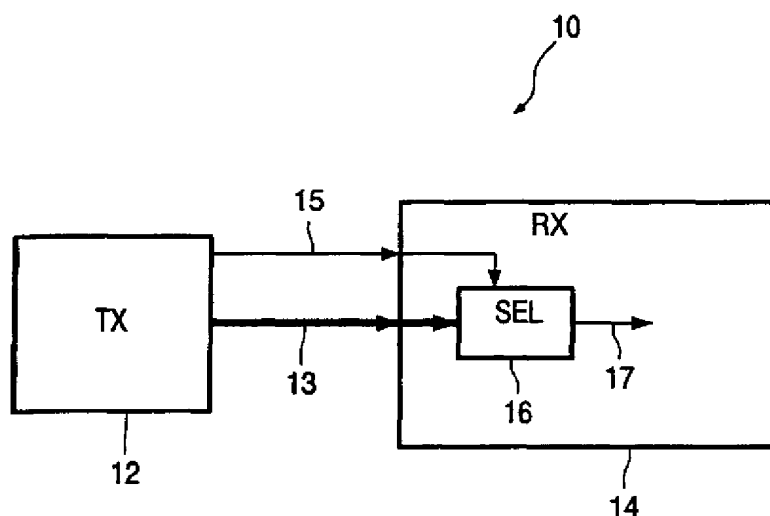
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For two-letter codes and other abbreviations, refer to the "Guid-
ance Notes on Codes and Abbreviations" appearing at the begin-
ning of each regular issue of the PCT Gazette.

(54) Title: TRANSMISSION SYSTEM



(57) Abstract: The invention relates to a transmission system (10) comprising a transmitter (12) and a receiver (14). The transmitter (12) is arranged for transmitting a plurality of signals (13), e.g. radio and/or television signals. The plurality of signals (13) comprise mutually corresponding signals, e.g. analog and digital signals of the same channel or program. Alternatively, the mutually corresponding signals may comprise standard definition and high definition signals of the same channel or program. The receiver (14) is arranged for receiving at least part of said plurality of signals (13). The transmitter (12) is arranged for

transmitting information (15) identifying said mutually corresponding signals and the receiver (14) is arranged for receiving said information (15). The receiver (14) comprises a selector (16) for selecting on basis of said information (15) at least one (17) of the mutually corresponding signals. In this way, the receiver (14) can automatically select the most appropriate signal (17), e.g. for inclusion in a list of available channels/programs or for reproduction.

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Transmission system

The invention relates to a transmission system comprising a transmitter and a receiver, the transmitter being arranged for transmitting a plurality of signals, the plurality of signals comprising mutually corresponding signals, the receiver being arranged for receiving at least part of said plurality of signals.

5 The invention also relates to a transmitter for transmitting a plurality of signals, a receiver for receiving at least part of a plurality of signals, a method of transmitting a plurality of signals and to a method of receiving at least part of a plurality of signals.

 The simultaneous transmission of mutually corresponding radio and/or television signals is sometimes referred to as simulcast. The mutually corresponding signals
10 may be versions of the same channel/program according to two or more standards, e.g. PAL and DVB, which are transmitted simultaneously during a transition period between these standards. Alternatively, the mutually corresponding signals may be standard definition (SD) and high definition (HD) signals of the same channel/program.

 Not every receiver may be able to receive or process, e.g. reproduce, all of the
15 mutually corresponding signals. For instance, a standard definition television receiver in general can not receive and display high definition television programs. Modern receivers are arranged to prepare a list of available channels/programs for presentation to a user so that the user can select a desired channel/program. A problem with such a list is that it contains entries for all the mutually corresponding signals, which may include signals which cannot be
20 received or processed by the receiver. The user thus finds channels/programs in the list which cannot be received or processed by the receiver.

 It is an object of the present invention to provide a transmission system according to the preamble which does not suffer from the above mentioned problem. This object is achieved in the transmission system according to the invention, said transmission
25 system being characterized in that the transmitter is arranged for transmitting information identifying said mutually corresponding signals and in that the receiver is arranged for receiving said information, the receiver comprising a selector for selecting on basis of said information at least one of the mutually corresponding signals. In this way the receiver can select automatically which of the mutually corresponding signals is best suited for inclusion

in the list so that the user is only confronted with a single entry for each channel/program. The selection may also be based on the capabilities of the receiver or on the quality of the received signals. For instance, a high definition television signal may be transmitted with less power than the therewith corresponding standard definition television signal. In case of bad
5 reception conditions the selector in a high definition television receiver may select the standard definition television signal.

The above object and features of the present invention will be more apparent
10 from the following description of the preferred embodiments with reference to the drawing, wherein:

Fig. 1 shows schematically an embodiment of a transmission system 10
according to the invention.

15 Fig. 1 shows schematically an embodiment of a transmission system 10 according to the invention. The transmission system 10 comprises a transmitter 12 and a receiver 14. The transmitter 12 transmits a plurality of signals 13, e.g. radio and/or television signals, to the receiver 14. The plurality of signals 13 comprises mutually corresponding
20 signals, e.g. analog and digital signals of the same channel or program. Alternatively, the mutually corresponding signals may comprise standard definition and high definition signals of the same channel or program. The receiver 14 receives at least part of the plurality of signals 13. The transmitter 12 transmits information 15 identifying said mutually
corresponding signals, which information 15 is received by the receiver 14. The receiver 14
25 comprises a selector 16 for selecting on basis of said information 15 at least one 17 of the mutually corresponding signals, e.g. for inclusion in a list of available channels or programs. The selection by the selector 16 may also be based on capabilities of the receiver 14, e.g. the ability to reproduce only SD signals, and/or on a quality of the received signals 13.

By means of example the simulcast of mutually corresponding SD and HD
30 video services and the information identifying these services will now be described in a DVB compliant system setting. DVB is a digital TV standard which is partly defined in the following document: ETSI EN 300468 "Digital Video Broadcasting (DVB) Specification for Service Information in DVB systems".

Two options are identified to create a simulcast situation for SD and HD video services:

The SD and HD services are in fact one DVB service and the two video components are carried as two alternative video components of a single service in a single transport stream. This is called the "Single Service Configuration Option".

The SD and HD services are two separate DVB services potentially carried in two different transport streams (be it on different frequencies and/or with a different geographical coverage e.g. using hierarchical modulation or just for bandwidth management reasons). This is called the "Multi Service Configuration Option".

Single Service Configuration Option:

This option requires that both SD and HD MPEG video elementary streams are part of a single service. In order to signal information identifying the mutually corresponding SD and HD video streams the components can be tagged with a component_descriptor in the EIT (Event Information Table) of the event that will describe the type of video component (SD or HD) (see table 12 of the above mentioned document). The corresponding video components can be tagged with a stream_identifier_descriptor in the PMT (Program Map Table) for that service (tag values matching the corresponding tag fields in the EIT).

Automatic selection of the appropriate video service can be handled by the receiver based on the EIT signaling, the type (SD and/or HD) stream available and the decoding capabilities of the receiver.

Multi Service Configuration Option:

Two signaling options are defined here to identify a service as being HD-only:

1. A new service type (carried in the service_descriptor in the SDT (Service Description Table) and optionally in the service_list_descriptor in the NIT (Network Information Table)).

2. Linkage descriptor carried in the SDT. This alternative, provides more compatibility to "existing" HD receivers but is less backward compatible to SD receivers.

The Multi Service Configuration Option requires that two services (on the same network) with essentially the same content (in SD and HD format respectively) are available (probably on different multiplexes, but with identical network_ids). The equivalence of both services is signaled by using the same logical channel number (LCN, carried in the logical_channel_descriptor of the NIT for both services). Note: in order for the receiver to recognize the equivalence of the services it is essential that both are carried by the

same network (i.e. are associated with the same network_id), but it is not essential that both are carried on the same transport stream. Services with the same LCN, different service_ids and different network_ids are considered to be regional variants.

Signaling option 1: new service type:

5 The difference between the SD and the HD version of the service is indicated by the "service_type" field in the "service_descriptor" carried in the SDT (and if available, in the service_list_descriptor carried the NIT). For the SD version of the service, service type 0x01 (digital television) is used. For the HD version of the service, service type 0x81 can be used (user defined by DVB, meaning "digital HD video service with an equivalent SD
10 service"). This definition allows SD receivers to ignore HD-only services in a fully backward compatible way, while HD receivers can easily disregard SD versions of the same service. It does require HD receivers to be aware of the new service_type however.

Signaling option 2: new linkage descriptor:

15 A new type of linkage_descriptor is introduced in the SDT: "SD service replacement link". The type_id used could be 0x90 (DVB user defined: meaning "SD replacement service link") or a regular DVB code (e.g. 0x12) could be applied for. It should be carried in the SDT for an HD service, pointing to the equivalent SD service. SD-only receivers can ignore services with this link and use the SD equivalent service pointed to by the link instead.

20 Following text applies to signaling option 1 and signaling option 2: HD receivers may store both versions of the service as options in their service list and select the SD service in case the reception quality of the HD service is poor. SD receivers can safely ignore HD-only services completely.

25 The scope of the invention is not limited to the embodiments explicitly disclosed. The invention is embodied in each new characteristic and each combination of characteristics. Any reference signs do not limit the scope of the claims. The word "comprising" does not exclude the presence of other elements or steps than those listed in a claim. Use of the word "a" or "an" preceding an element does not exclude the presence of a plurality of such elements.

CLAIMS:

1. Transmission system (10) comprising a transmitter (12) and a receiver (14), the transmitter (12) being arranged for transmitting a plurality of signals (13), the plurality of signals (13) comprising mutually corresponding signals, the receiver (14) being arranged for receiving at least part of said plurality of signals (13), characterized in that the transmitter
5 (12) is arranged for transmitting information (15) identifying said mutually corresponding signals and in that the receiver (14) is arranged for receiving said information (15), the receiver (14) comprising a selector (16) for selecting on basis of said information (15) at least one (17) of the mutually corresponding signals.
- 10 2. Transmission system (10) according to claim 1, characterized in that the plurality of signals (13) comprises radio and/or television signals.
3. Transmission system (10) according to claim 2, characterized in that the mutually corresponding signals (13) relate to a same channel or program.
- 15 4. Transmission system (10) according to claim 3, characterized in that the mutually corresponding signals (13) comprise analog and digital signals of the same channel or program.
- 20 5. Transmission system (10) according to claim 3 or 4, characterized in that the mutually corresponding signals (13) comprise standard definition and high definition signals of the same channel or program.
6. Transmission system (10) according to any one of the preceding claims,
25 characterized in that the selector (16) is arranged for selecting the at least one (17) of the mutually corresponding signals for inclusion in a list of available channels or programs.
7. Transmission system (10) according to any one of the preceding claims, characterized in that the selector (16) is arranged for selecting the at least one (17) of the

mutually corresponding signals also on basis of capabilities of the receiver (14) and/or on a quality of the received signals (13).

8. Transmitter (12) for transmitting a plurality of signals (13), the plurality of
5 signals (13) comprising mutually corresponding signals, characterized in that the transmitter (12) is arranged for transmitting information (15) identifying said mutually corresponding signals.

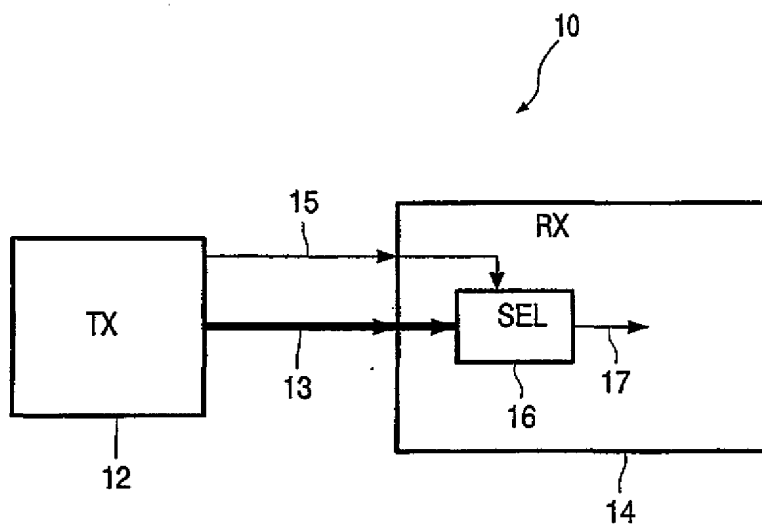
9. Receiver (14) for receiving at least part of a plurality of signals (13), the
10 plurality of signals (13) comprising mutually corresponding signals, characterized in that the receiver (14) is arranged for receiving information (15) identifying said mutually corresponding signals, the receiver (14) comprising a selector (16) for selecting on basis of said information (15) at least one of the mutually corresponding signals.

15 10. A method of transmitting a plurality of signals (13), the plurality of signals (13) comprising mutually corresponding signals, characterized in that the method comprises transmitting information (15) identifying said mutually corresponding signals.

11. A method of receiving at least part of a plurality of signals (13), the plurality
20 of signals (13) comprising mutually corresponding signals, characterized in that the method comprises:

- receiving information (15) identifying said mutually corresponding signals,
and
- selecting on basis of said information (15) at least one of the mutually
25 corresponding signals.

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INTERNATIONAL SEARCH REPORT

International Application No.

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A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 H04N7/08 H04N7/06 H04N7/025

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 H04N H04H

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X Y	WO 88 01464 A (ABBOTVILLE PTY LTD) 25 February 1988 (1988-02-25) abstract page 3, line 11 -page 3, line 24 page 16, line 10 -page 16, last line ---	1-3,5, 8-11 4,6
X	HORN U ET AL: "Scalable video transmission for the Internet" COMPUTER NETWORKS AND ISDN SYSTEMS, NORTH HOLLAND PUBLISHING. AMSTERDAM, NL, vol. 29, no. 15, 1 November 1997 (1997-11-01), pages 1833-1842, XP004099485 ISSN: 0169-7552 page 1836, left-hand column, paragraph 2 -page 1836, left-hand column, last line --- -/--	1,7-11

☒ Further documents are listed in the continuation of box C.☒ Patent family members are listed in annex.

* Special categories of cited documents:

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- *T* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
- *X* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- *Y* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.
- *&* document member of the same patent family

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INTERNATIONAL SEARCH REPORT

International Application No

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C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
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INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

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